

1 **CLAIMS**

2 What is claimed is:

4 1. A method comprising:

5 providing image data; and

6 performing a Hough transform on the image data using a host
7 processor and an operatively configured graphics processor.

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9 2. The method as recited in Claim 1, wherein the graphics processor is
10 configured to count votes in a resulting Hough transform voting
11 buffer.

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13 3. The method as recited in Claim 1, wherein the graphics processor is
14 configured to convolve image values and provide corresponding
15 results to the host processor.

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17 4. The method as recited in Claim 1, wherein the graphics processor
18 performs an alpha-blending operation that selectively increments
19 accumulators that correspond to parameter combinations that are
20 likely associated with an observation.

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22 5. The method as recited in claim 1, wherein the graphics processor
23 performs a histogram computation to find the maxima value in the
24 Hough transform voting buffer.

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2. An apparatus comprising:
3. a host processor configured to provide image data; and
4. a graphics processor operatively coupled to the host processor and
5. configured to perform selected steps of a Hough transform algorithm
6. on the image data in association with the host processor.
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7. The apparatus as recited in Claim 6, further comprising a local
8. memory operatively coupled to the graphics processor and wherein
9. the graphics processor is configured to count votes in a resulting
10. Hough transform voting buffer within the local memory.
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13. 8. The apparatus as recited in Claim 6, wherein the graphics processor
14. is configured to convolve image values and provide corresponding
15. results to the host processor.
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17. 9. The apparatus as recited in Claim 6, further comprising a local
18. memory operatively coupled to the graphics processor and wherein
19. the graphics processor performs an alpha-blending operation that
20. selectively increments accumulators within the local memory that
21. correspond to parameter combinations that are likely associated with
22. an observation.
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24. 10. The apparatus as recited in claim 6, further comprising a local
25. memory operatively coupled to the graphics processor and wherein

the graphics processor performs a histogram computation to find the maxima value in the Hough transform voting buffer within the local memory.

11. A computer-readable medium having computer-executable instructions for performing steps comprising:
 - providing image data; and
 - performing a Hough transform on the image data using a host processor and an operatively configured graphics processor.
 12. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor to count votes in a resulting Hough transform voting buffer.
 13. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor to convolve image values and provide corresponding results to the host processor.
 14. The computer-readable medium as recited in Claim 11, having computer-executable instructions that cause the graphics processor to perform an alpha-blending operation that selectively increments accumulators that correspond to parameter combinations that are likely associated with an observation.

1 15. The computer-readable medium as recited in claim 11, having
2 computer-executable instructions that cause the graphics processor
3 to perform a histogram computation to find the maxima value in the
4 Hough transform voting buffer.

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6 16. A method comprising:

7 causing dedicated graphics hardware to support at least one of the
8 following steps associated with a Hough transform algorithm:

9 quantizing a bounded portion of a parameter space that may contain
10 a desired feature;

11 for each discrete quantized parameter combination, allocating an
12 incrementable accumulator;

13 gathering observations that can be mapped into the parameter space;

14 for each observation, incrementing each of the accumulators that
15 corresponds to parameter combinations that may have produced the
16 observation; and

17 determining the maxima in a resulting quantized parameter array and
18 the corresponding parameter combinations.